

March 1998

ELECTRONIC WARFARE

Test Results Do Not Support Buying More Common Sensor Systems



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United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

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March 24, 1998

The Honorable William S. Cohen
The Secretary of Defense

Dear Mr. Secretary:

We have completed our follow-up review of the Intelligence and Electronic Warfare Common Sensor (IEWCS) program, which is to provide the Army and the Marine Corps with improved signals intelligence capability. In 1995, we suggested the Army's fiscal year 1996 IEWCS procurement request be reduced because operational testing to prove the system worked properly was not scheduled until fiscal year 1997.¹ In 1996, we reported the Army had prematurely committed to low-rate production the prior year and recommended that additional IEWCS production planned for fiscal year 1997 be canceled.² In response, the Department of Defense (DOD) reduced the number of systems to be procured, but permitted the Army to proceed. To assist the Congress in its oversight of DOD's management of systems acquisitions, we conducted this follow-up review to determine whether results of testing conducted since our previous review support continued IEWCS production.

Background

IEWCS Objective Is to Provide Improved Signals Intelligence

IEWCS is being concurrently designed and produced to provide select Army and Marine Corps units with improved signals intelligence and electronic attack capability against communications systems used by hostile forces. Through fiscal year 1997, the Army and the Marine Corps have spent a total of \$750.8 million to develop IEWCS and procure 17 systems for the Army and the Marine Corps. These IEWCS systems have been or are to be fielded on Army light vehicles, heavy armored vehicles, or EH-60 helicopters, and Marine Corps light armored vehicles. (See fig. 1.)

¹1996 Defense Budget: Potential Reductions, Rescissions, and Restrictions in RDT&E and Procurement (GAO/NSIAD-95-218BR, Sept. 15, 1995).

²Electronic Warfare: Additional Buys of Sensor System Should Be Delayed Pending Satisfactory Testing (GAO/NSIAD-96-175, Sept. 27, 1996).

Figure 1: EH-60 Helicopter Hovers Over (l. to r.) Army Light and Heavy and Marine Corps Light Armored Vehicles



Source: U.S. Army.

IEWCS is expected to be capable of intercepting enemy communications signals, locating the source of those signals, and jamming them electronically. It is also expected to be capable of locating enemy radars.

The Army started low-rate initial production (LRIP) in fiscal year 1995 on an urgent basis to field IEWCS on light vehicles to counter a particular type of communications system. To further address its urgent need, the Army also planned to add IEWCS to seven EH-60 helicopters using 2 additional years of LRIP. The first three EH-60 IEWCS systems were planned for fiscal year 1996 and the remaining four systems for fiscal year 1997.

Commitment to IEWCS LRIP Was Premature

The DOD Comptroller considered our 1995 report in evaluating the Army's fiscal year 1997 budget request and reduced the Army's planned second procurement of EH-60 IEWCS systems from four to one. Subsequently, we monitored the IEWCS program in anticipation of forthcoming 1996 developmental tests.

In September 1996, we concluded on the basis of the developmental test results that the Army had prematurely committed to LRIP of the unproven IEWCS system and planned additional LRIP that was not justified by test results. We also pointed out that the Army had plans to enter full-rate production without demonstrating that IEWCS could meet minimum acceptable operational performance requirements. Furthermore, we concluded that unless this acquisition strategy was changed, the Army was at risk of becoming committed to procuring an unsatisfactory system requiring redesign and retrofit to achieve acceptable system performance.

We recommended that the Secretary of Defense require the Army to cancel the planned fiscal year 1997 procurement of one EH-60 IEWCS system; establish specific, measurable, minimum acceptable performance requirements; and demonstrate IEWCS capability to meet these requirements before proceeding with additional procurement. DOD did not cancel planned fiscal year 1997 production, but did agree that the Army should establish key performance parameters before conducting Initial Operational Test and Evaluation planned for fiscal year 1997. (Operational testing is DOD's primary means of determining if a system will be effective and suitable in a realistic combat environment.)

Results in Brief

Test results now available do not support continued IEWCS production. The Army postponed operational testing scheduled for fiscal year 1997 that was to demonstrate IEWCS operational effectiveness and suitability in a realistic combat environment. The Army replaced operational testing with less-rigorous developmental testing, which showed that the system has serious hardware and software problems. Furthermore, fiscal year 1996

tests of IEWCS on a Marine Corps vehicle showed that the Marine Corps' IEWCS prototype also has serious problems, including inaccurately identifying the direction to hostile communication systems by as much as 100 degrees. Although the Army plans to conduct additional research and development work on IEWCS, in the interim, it still intends to contract for five more systems while trying to correct the problems. Lastly, despite the IEWCS system's many problems, the Marine Corps has joined with the Army and is procuring two IEWCS systems.

Operational Testing Canceled While Serious Problems Remain

Subsequent to our 1996 report, the Army postponed the planned fiscal year 1997 operational test of IEWCS. Instead, the Army conducted additional less-rigorous developmental testing of the system on Army vehicles and an operational assessment of IEWCS on a Marine Corps vehicle. These tests revealed that serious problems remain to be corrected for IEWCS on both the Army and the Marine Corps platforms.

Army Addressing Hardware and Software Problems

According to the IEWCS Project Manager, the Army is concentrating on overcoming 47 software-related technical issues and 19 hardware and maintenance issues identified during additional developmental testing on Army vehicles. While many of the specifics of the problems are considered classified by the Army, in general, the software issues focus on system robustness, system accuracy, ease of use, and system throughput. According to program officials, there are several software problems for which no short-term fixes exist and additional systems engineering will be required at some later date. The hardware issues deal generally with system accuracy, and the maintenance issues with reliability. In addition to those problems, the Army remains concerned about the inability of IEWCS systems to demonstrate the ability to share data with each other. This is necessary for precisely locating hostile communication sources so they can be attacked, the primary reason why the Army wants IEWCS.

Test of Marine Corps IEWCS Revealed Serious Problems

Tests of the Marine Corps' prototype IEWCS system have also revealed serious problems. In September 1996, after the planned Army operational test was postponed, the Army's Test and Experimentation Command (TEXCOM) at Fort Huachuca, Arizona, conducted a less rigorous operational assessment of an IEWCS system mounted in a Marine Corps light armored vehicle.

In preparation for the test, the Marine Corps identified criteria to measure 46 parameters of the system. During the assessment, however, Army testers only attempted to achieve 26 of the Marine Corps' criteria, and the system experienced significant problems. For example, the system was expected to identify the direction to the source of an intercepted communications signal within 5 degrees, but experienced inaccuracies of up to 100 degrees.

In addition, other significant weaknesses observed during the assessment of the Marine Corps' IEWCS system included ineffective active noise reduction headsets, leaving operators unable to hear intercepted communications, and IEWCS system crashes when operators used the digital tape recorder storage system. The Marine Corps system also required frequent recalibration to try to get accurate readings of the direction of intercepted signals. As a result of these and other problems, the system failed every 4.08 hours on average, though the desired mean time between operational mission failure rate is 65 hours. Upon completion of the Operational Assessment, TEXCOM described it as an "extremely complex, maintenance heavy, contractor dependent system."

Additionally, the assessment of the Marine Corps' IEWCS system was not representative of expected operational conditions and was hampered due to mechanical problems with the vehicle's generator and air conditioning. As a result, instead of being tested on-the-move, the vehicle sat in place, connected to external electrical power and air conditioning to keep the IEWCS components activated. This limitation precluded testing of the system's capability to operate while moving and therefore 20 of the 46 performance parameters could not be tested.

Marine Corps Begins IEWCS LRIP Despite Poor Test Results

Despite the poor test results, the Marine Corps approved LRIP of two IEWCS systems. According to officials of the Marine Corps Operational Test and Evaluation Activity who reviewed the results, the assessment (1) demonstrated that the Marine Corps' IEWCS system had potential, (2) provided a yardstick to measure future progress, and (3) provided focus for continued development. Therefore, the Marine Corps decided to award an \$11 million contract for two IEWCS systems in December 1996.

Revised Acquisition Strategy Still Allows Some Production

Since the 1996 test of the Marine Corps' IEWCS prototype, the Army has revised its acquisition strategy and now plans to conduct additional research and development work on the IEWCS system to try to improve its performance. In addition, the Congress denied the Army's fiscal year 1998

budget request for \$26.8 million for continued IEWCS production, citing the failure of the Army to submit the system to operational testing.

However, even though the Army acknowledges the system's problems, it still intends to use funds provided by the Congress prior to fiscal year 1998 to contract for two more IEWCS systems for light vehicles and three more IEWCS for EH-60 helicopters. The Army plans to contract for these five systems before the results of its additional research and development efforts are known and before a rescheduled operational test is conducted in May 1998.

Recommendation

The Army plans to contract for five more IEWCS systems without demonstrating that additional research and development efforts have corrected known deficiencies. Therefore, we recommend that you direct the Secretary of the Army to delay contracting for additional IEWCS systems until operational testing demonstrates that the system's many problems are fixed.

Agency Comments

In written comments on a draft of this report, DOD concurred with the report and our recommendation. According to DOD, the Army has revised its plans, taken steps to reduce the technical problems we cited, and no longer intends to procure additional IEWCS systems in fiscal year 1998. Furthermore, DOD stated that the Army has adjusted the program's schedule to ensure that no further procurement decisions will be made without supporting operational test results. DOD's comments are reprinted in appendix I.

Scope and Methodology

To address our objective of determining whether test results support continued IEWCS production, we interviewed Army IEWCS program officials and reviewed briefing, budgetary, and planning documents from the office of the Army Project Manager, Signals Warfare, Vint Hill Farms Station, Warrenton, Virginia (now located at Fort Monmouth, New Jersey). We also interviewed Marine Corps test officials and obtained test plan and report documents from the Office of the Mobile Electronic Warfare Support System Project Manager and the Marine Corps Operational Test and Evaluation Agency, Quantico, Virginia. We obtained, reviewed, and analyzed test results prepared by the Intelligence and Electronic Warfare Test Directorate, Fort Huachuca, Arizona.

We conducted our review between January and December 1997 in accordance with generally accepted government auditing standards.

As you know, 31 U.S.C. 720 requires the head of a federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Reform and Oversight not later than 60 days after the date of the report. A written statement must also be submitted to the Senate and House Committees on Appropriations with an agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this letter to interested congressional committees, the Secretaries of the Army and the Navy, and the Director of the Office of Management and Budget. We will also provide copies to others upon request.

If you or your staff have questions, please contact me at (202) 512-4841. Major contributors to this assignment were Robert Coleman, Charles Ward, and Paul Latta.

Sincerely yours,

A handwritten signature in cursive script that reads "Louis J. Rodrigues". The signature is written in dark ink and is positioned above the printed name and title.

Louis J. Rodrigues
Director, Defense Acquisition Issues

Comments From the Department of Defense



OFFICE OF THE UNDER SECRETARY OF DEFENSE

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09 FEB 1998

Mr. Louis J. Rodrigues
Director, Defense Acquisition Issues
National Security and International
Affairs Division
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Rodrigues:

This is the Department of Defense (DOD) response to the General Accounting Office (GAO) Draft Report, "ELECTRONIC WARFARE: Test Results Do Not Support DOD Plans To Buy More Common Sensor Systems," Dated December 29, 1997 (GAO Code 707229/OSD Case 1514). The Department concurs with the report.

The enclosure provides specifics regarding the U.S. Army's efforts in ensuring that critical procurement decisions will be made after appropriate operational testing of the Intelligence and Electronic Warfare Common Sensor (IEWCS) program is completed. While the Army procured two systems during FY97, there is no intention to procure additional systems in FY98. Initial Operational Test and Evaluation (IOT&E) for the Ground Based Common Sensor-Light (GBSC-L) system is scheduled for 4Q FY98 with Milestone III decision following. A combined IOT&E for GBSC-Heavy (GBSC-H) and Advanced Quick Fix (AQF) is planned during 4Q FY99.

The Department appreciates the opportunity to comment on the GAO draft report. Detailed comments have been provided separately.

Sincerely,

George R. Schneider
Director
Strategic and Tactical Systems

Enclosure



GAO DRAFT REPORT - DATED DECEMBER 29, 1997
(GAO CODE 707229) OSD CASE 1514

**"ELECTRONIC WARFARE: TEST RESULTS DO NOT SUPPORT DOD PLANS TO
BUY MORE COMMON SENSOR SYSTEMS"**

DEPARTMENT OF DEFENSE COMMENT TO THE GAO RECOMMENDATION

RECOMMENDATION: The GAO recommended that the Secretary of Defense direct the Secretary of the Army to delay contracting for additional Intelligence and Electronic Warfare Common Sensor (IEWCS) systems until operational testing demonstrates that the system's many problems are fixed. (p. 8/GAO Draft Report)

DOD RESPONSE: Concur. The Army has taken steps to reprogram and realign procurement funding during FY97, FY98, and FY99, resulting in procurement of fewer systems than originally planned (two versus five in FY97). The program's test schedule has been adjusted so that it is aligned to ensure that no Milestone III or procurement decisions will be made without supporting operational test results. The GAO's recommendation not to procure additional systems in FY98 is incorporated in the current schedule.

The Department believes that the Army has taken appropriate steps to reduce the technical problems cited in the GAO draft report and to ensure that the IEWCS program conducts sufficient IOT&E before making any production decisions. Oversight from OSD/DOT&E has been instrumental in structuring these test efforts. The IOT&E for GBSC-L is scheduled for July 7, 1998 - August 11, 1998. The USMC also will be actively involved in this IOT&E and will subsequently make their procurement decisions based on the test results. The combined IOT&E for GBSC-H and AQF is to occur during 4Q FY99. Because of these actions, the recommendation made in the GAO draft report is satisfied.

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